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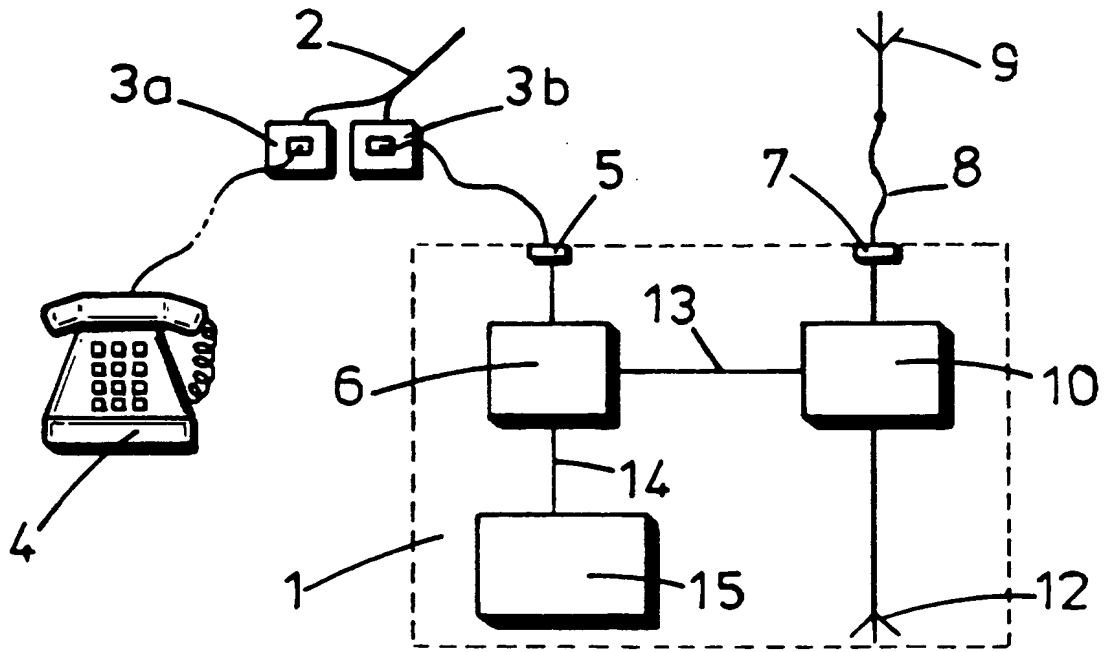


FIG. 1

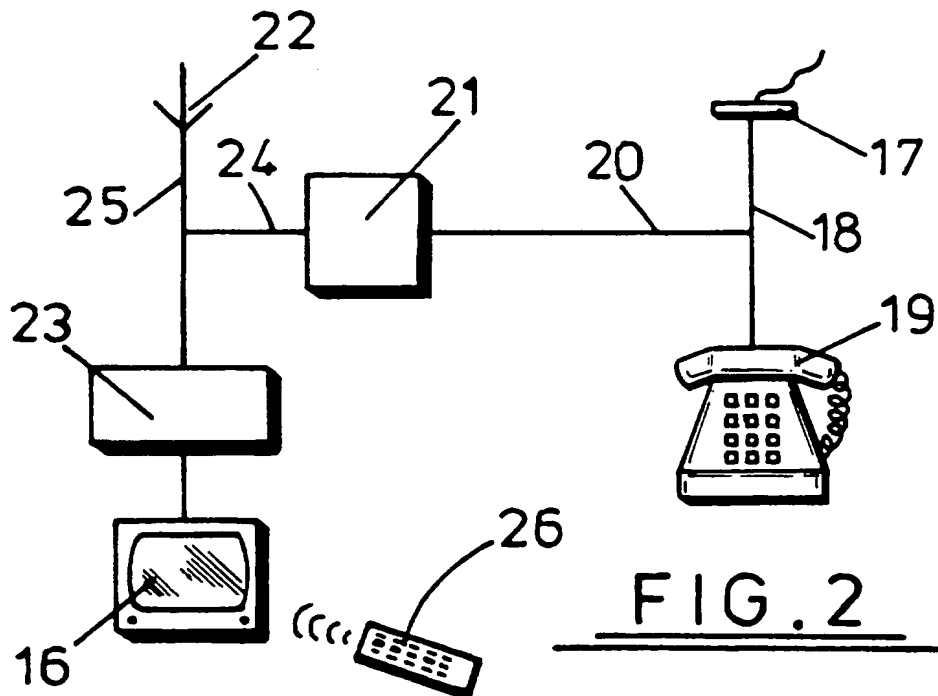
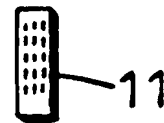


FIG. 2

TELEPHONE CALLER DISPLAYS

The present invention relates to telephone caller displays and in particular, though not necessarily, to systems which enable the name of a person, or organisation, making an incoming telephone call to be displayed on a television set at the premises of the call recipient.

Due to advances in technology, and to increasing competition in the telecommunications market, providers of telephone services are now striving to increase the services available to subscribers. One such service now made available in the United Kingdom by British Telecom is known as "Caller Display" and enables the telephone number of a caller to be displayed on a liquid crystal display (LCD) of a specially modified telephone of the call recipient. On seeing the display telephone number the recipient has the choice of whether or not to answer the telephone. However, few people can remember more than a few telephone numbers and the caller display service is of limited practical use to household subscribers. More recently however, British Telecom have made available a further service which enables the listed name of the telephone from which the call is made to be displayed on a similar LCD of the recipient's telephone. Whilst this service is of more practical use than caller number display it still requires that the recipient must move to the telephone in order to read the name displayed on the LCD before he can make a decision on whether or not to answer the telephone or who the call is intended for.

It is a first object of the present invention to provide a system for caller identification display which allows a caller's name or other identifying data to be made visible in the normal living environment of the call recipient and which does not require the recipient to make his way to the telephone in order to read the name or data.

It is a second object of the present invention to provide a system which enables the name or other identifying data of a telephone caller to be displayed on a video display which is in an on condition when the telephone call is received. In

particular, it is an object of the present invention to enable the display of the name or data to occur on a conventional television set.

- According to a first aspect of the present invention there
- 5 is provided a system suitable for use in displaying identification data of a telephone caller on a television display or on a video display unit of a computer located at the site of the call recipient but spaced apart from the recipient's telephone, the system comprising:
- 10 detector means for detecting an incoming telephone call on a bi-directional telephone line;
- signal processing means for extracting caller identification data from a signal present on the telephone line when an incoming call is detected; and
- 15 video signal generation means for generating a video signal containing the caller identification data, or identification data derived therefrom, and for supplying said video signal to the television or the computer video display unit for display thereon.
- 20 The present invention is particularly useful for use with a television set. It will be appreciated that often a family television set is on in the living room of a house when a telephone call is made to that house and that by displaying the name of the caller on the television set the persons
- 25 watching the set will be made aware of who is making the call without having to move to the telephone. In the case where a number of people are sharing a house, this facility will indicate which member of the household should answer the telephone and thus reduces the likelihood of arguments
- 30 occurring over whose task this should be.
- Where caller identification data is to be displayed on a television set, the data may be displayed in a number of ways. For example, the television set may have a unit which receives the extracted caller identification data and over-
- 35 writes this data onto the television picture regardless of which television channel is currently selected. In this case, the unit over-writes the data onto the video signal which has been obtained by demodulating a received television signal.

Alternatively, the extracted caller identification data may be encoded onto an unused television channel, which channel can be selected by the user, for example using a remote control, when the telephone is heard to ring. This approach is particularly applicable for use with a conventional television set where the system can be provided as an "add-on" unit for connection between the telephone, or telephone socket, and the television set.

Another alternative approach to implementing the above first aspect of the invention with a television set, is to provide means for writing the extracted caller identification data into an empty page of teletext which can be called up by a person watching the television set when the telephone is heard to ring.

It will thus be appreciated that the present invention can either be incorporated into a television set itself, the television set having an input socket for receiving a line from the bi-directional telephone line, or alternatively could be provided as an "add-on" for a conventional television set. Whilst the former has the advantage of adding value to the selling price of a television set, the latter has the advantage that the consumer need only buy a relatively cheap additional unit and does not require a completely new television set.

Preferably, the caller identification data for display is the name of the caller. In circumstances where name data is not transmitted with an incoming telephone call, and only the caller's number is transmitted, the signal processing means may comprise a memory device for storing a look-up table matching known telephone numbers with caller names and means for accessing the look-up table to determine a caller name corresponding to an extracted telephone number. The caller name provides the identification data for display. The system according to the first aspect of the invention may, for example, be used with a computer which has been adapted to receive and display a television signal.

According to a second aspect of the present invention there is provided a system suitable for use in displaying identification data of a telephone caller on a video display

unit of a computer located at the site of the call recipient but spaced apart from the recipient's telephone, the system comprising:

detector means for detecting an incoming telephone call on a
5 bi-directional telephone line;
signal processing means for extracting caller identification data from a signal present on the telephone line when an incoming call is detected; ;and
program code for loading into a computer and for displaying
10 said extracted caller identification data on a video display unit of the computer.

A system according to the above described second aspect of the invention may be incorporated in a computer. The program code for displaying the extracted caller
15 identification data may be stored in the hard disk of the computer. Various suitable forms of program may be used. Conveniently though the program is formed and arranged so as to only activate a screen display e.g. open a window, upon detection of an incoming call and/or extraction of caller
20 identification data.

According to a third aspect of the present invention there is provided a telephone, or a device for use with a telephone, comprising:
detector means for detecting an incoming telephone call on a
25 bidirectional telephone line;
signal processing means for extracting caller identification data from a signal present on the telephone line when an incoming call is detected, the signal processing means further having a memory device for storing a plurality of
30 distinct sets of identification data classified into a plurality of classes and means for identifying if the extracted identification data is stored in one of said classes and if so which; and
means for providing an audio or visual indication of the
35 class of an incoming call.

Preferably, the indication of class is provided by means for changing the ringing sound of the telephone depending upon the class of an incoming call.

A device according to the above third aspect of the present

invention may be incorporated into the system for displaying identification data described hereinbefore.

According to a fourth aspect of the present invention, there is provided a method of displaying identification data

5 corresponding to a telephone caller on a television or on a video display unit of a computer located at the site of the call recipient but spaced apart from the telephone, the method comprising the steps of:

detecting the presence of an incoming telephone call on a
10 bi-directional telephone line;

extracting caller identification data from a signal present on the telephone line when an incoming call is detected;

generating a video signal containing the caller identification data or identification data derived

15 therefrom, and

supplying the video signal to the television or the video display unit for display thereon.

For a better understanding of the present invention and in order to show how the same may be carried into effect

20 reference will now be made, by way of example, to the accompanying drawings, in which:

Figure 1 shows a caller name display system for incorporation into a television set; and

Figure 2 shows a caller name display unit for use as an add-
25 on to a conventional television set.

There is shown in Figure 1 a television set 1 which incorporates a system for displaying the name of a telephone caller, where the caller name is transmitted along with the initial ringing signal of the call. The telephone call is
30 received on a twisted pair type cable 2 which terminates at a telephone socket 3a. A spur line runs from the point of termination at the first socket 3a to a second socket 3b. Whilst a telephone 4 is connected to the first socket 3a in the normal manner, the second socket 3b is connected to an
35 input socket 5 provided at the rear of the television set 1. When an incoming telephone call is received on the twisted pair cable 2, the signal is fed to a name data extraction and mixer unit 6 via the input socket 5. The unit 6 acts to extract the caller name data transmitted along with the call

signal. In the United Kingdom, the signal requirements have been set by British Telecom and are explained in detail in Suppliers Information Note 227, June 1993, issue 01, available from BT Development and Procurement. The hardware
5 and software requirements of the unit 6 are determined by the telephone service supplier's standards.

As is usual, the television set also receives at a second radio frequency, input socket 7 a co-axial cable 8 coupled to an aerial 9 which receives television signals modulated
10 onto respective radio frequency carriers. The television set 1 comprises a demodulation unit 10 which extracts the television signal corresponding to a user selected channel. Channel selection may be carried out using a remote control unit 11 which communicates with a television mounted
15 receiver 12 or using a control panel (not shown) provided on the television set 1 itself.

The video signal 13 extracted by the demodulation unit 10 is transmitted to the data extraction and mixer unit 6, the latter being arranged to over-write the caller name onto the
20 video signal 11 such that the name appears at a given location in each frame of the video signal. The video signal 14 with the overwritten name is subsequently transmitted to a display driver and display unit 15 where it is displayed on the CRT display (not shown) of the
25 television set 1 at the same time as the telephone 4 rings.

Whilst the television set of the embodiment of Figure 1 is shown connected to a second telephone socket 3b, it may be more convenient in some cases to connect the television set to the same socket 3a as the telephone 4 by using an
30 appropriate adaptor.

In order to provide a system which can be used with a conventional television set, but which provides the same end result as the system of Figure 1, the name data extraction and mixer unit 6 may be provided in an external unit.
35 However this unit would require to have the capability to demodulate each channel receivable by the television set, overwrite the name data onto each channel, and remodulate the various video signals for supply to the RF input 7 of

the television set.

A modification which could be made to both of the above described embodiments is to write the name data to an appropriate teletext page of each channel, e.g. page 000.

- 5 On hearing a telephone ringing a user would call up the appropriate teletext page to see the caller's name displayed.

Figure 2 shows a second embodiment of the present invention which is suitable for use with a conventional television set
10 16 which requires no modification. An incoming telephone call is received at a socket 17 and is transmitted via a twisted pair cable 18 to a telephone 19. A twisted pair spur 20 connects the telephone socket 17 to a caller name extraction unit 21. The caller display extraction unit 21
15 is arranged to extract the caller name data from an incoming telephone call and to generate a radio frequency (RF) television signal using this data such that the television signal corresponds to a plain, e.g. black or blue, background screen with the caller name overwritten at a
20 given position on the screen.

The television set 16 receives incoming television signals from an aerial 22 either directly or via a video cassette recorder 23 (as shown in Figure 2). An RF output 24 from the caller name extraction unit 21 is coupled to the RF co-
25 axial lead 25 connecting the aerial to the VCR to provide a combined RF signal. The caller name extraction unit is arranged to generate its RF television signal on a channel other than one of the channels allocated to television stations in the local area of the viewer. The combined RF
30 signal fed to the VCR 23 therefore comprises a channel incorporating caller name data. The VCR supplies this combined signal, together with a further VCR channel, to the television set 16. This connection may be made via a SCART socket (European Standard EN 50 049).

- 35 When a viewer hears the telephone ringing, he uses a remote control 26 to select that channel which incorporates the telephone name data so that he can see who is making the call.

In a further embodiment of the present invention, again for

use with a conventional television set, the caller name extraction unit 21 of Figure 2 is replaced by an interface device which, in addition to including a caller name extraction unit, also incorporates a number of other units
5 which allow the user to interact with remote systems using the remote control device 26. For example, the interface unit could incorporate a modem which enables the user to access a home banking, or a home shopping, service provided to subscribers over the telephone line by remote operators.
10 These services would typically operate by generating, in the interface unit, a video signal containing appropriate teletext information which can then be supplied to the television 16 for display thereon. The user could interact with the service by using the remote control to transmit
15 data to the interface which would then relay that data, in an appropriate form, over the telephone line to the remote operator.

It will be appreciated by the skilled person that various modifications may be made to the above described embodiments
20 without departing from the scope of the invention. For example, the television set could be replaced by a personal computer having a video card or the like for receiving and displaying television video signals. Alternatively there are may conveniently be used an interface unit having an
25 output interface connection for coupling to a suitable interface port provided on the computer, most conveniently, serial or parallel, or if desired, SCSI, IDE,.

The interface unit may moreover be incorporated in an expansion card which couples with a suitable databus within
30 the computer, or could even be incorporated within the motherboard. In this case it will be understood that the caller identification data would not normally be converted into a television video signal but could be output from the interface unit as for example ASCII text together with
35 control signals for activating suitable communications or other software resident in the computer to overwrite at least part of the VDU screen with the caller identification data. Most conveniently this could be implemented in a multi-tasking environment by opening a window to display

this data. As used herein the term "computer" can encompass a wide range of devices which have video display units including dedicated games machines and the like.

It is also anticipated that instead of receiving television signals broadcast over the ether, television signals could be received from a cable television network. In some circumstances, it is also possible that the telephone cable and the cable carrying the television signal would form part of a combined cable. A further possibility is that the telephone and television signals could be transmitted along the same cable, for example an optical fibre cable. Where the telephone service supplier only provides caller telephone number information with an incoming call, a display system may comprise a memory storing look-up table which contains a list of numbers, together with respective caller names, this data being entered into the memory by the subscriber. When a telephone number is extracted from an incoming call, the look-up table is searched to see if that number has been stored. If it has, the corresponding name is extracted for display on the TV Screen. If the number is not stored, the screen may display the number together with a message such as "caller unknown". In a further modification of this embodiment, the stored names may be grouped into classes, e.g. 'personal' and 'business' names or 'parents' and 'children' names. The ringing sound of the telephone could be changed to indicate the class of caller.

CLAIMS

1. A system suitable for use in displaying identification data of a telephone caller on a television display or on a video display unit of a computer located at the site of the call recipient but spaced apart from the recipient's telephone, the system comprising:
detector means for detecting an incoming telephone call on a bi-directional telephone line;
signal processing means for extracting caller identification data from a signal present on the telephone line when an incoming call is detected; and
video signal generation means for generating a video signal containing the caller identification data, or identification data derived therefrom, and for supplying said video signal to a television display or a computer video display unit for display thereon.

2. A system according to claim 1 wherein the system is provided as a stand-alone unit.

3. A system according to claim 1 or claim 2, wherein the video signal containing the extracted caller identification data is formed and arranged for display on a television channel not used for receiving a signal from a television station.

4. A system according to claim 2 wherein said unit includes television signal receiver means formed and arranged for demodulating received television signals, and means for overwriting said extracted caller identification data onto each television channel signal, and remodulating the resultant video signals for supply to a radio-frequency (RF) input of a television set or a computer adapted to receive television signals.

5. A system according to any preceding claim wherein the extracted caller identification data comprises the name of the caller.

6. A system according to any of claims 1 to 5 wherein the extracted caller identification data comprises a telephone number.

7. A system according to claim 6 wherein said signal processing means includes a memory device for storing a look-up table matching known telephone numbers with caller names and means for accessing the look-up table to determine a caller name corresponding to an extracted telephone number.

8. A television set incorporating a system according to claim 1 or claim 2 wherein said system is formed and arranged to superimpose said video signal onto a video signal which has been obtained by demodulating a received television signal.

9. A television set according to claim 8 wherein is provided means for writing the extracted caller identification data into a page of teletext.

10. A system suitable for use in displaying identification data of a telephone caller on a video display unit of a computer located at the site of the call recipient but spaced apart from the recipient's telephone, the system comprising:
detector means for detecting an incoming telephone call on a bi-directional telephone line;
signal processing means for extracting caller identification data from a signal present on the telephone line when an incoming call is detected; and
program code for loading into a computer and for displaying said extracted caller identification data on a video display unit of the computer.

11. A system according to claim 10 wherein said program code is formed and arranged for activating a screen display so as to cause said extracted data to be display on the video display unit of the computer upon detection of an

incoming call.

12. A system according to claim 10 or claim 11 wherein said
detector means and signal processing means are provided in
an interface unit for coupling to an interface port of a
5 computer.

13. A computer incorporating a system according to any one
of claims 10 to 12.

14. A device for use with a telephone, comprising:
detector means for detecting an incoming telephone call on a
10 bidirectional telephone line;
signal processing means for extracting caller identification
data from a signal present on the telephone line when an
incoming call is detected, the signal processing means
further having a memory device for storing a plurality of
15 distinct sets of identification data classified into a
plurality of classes and means for identifying if the
extracted identification data is stored in one of said
classes and if so which;
means for providing a plurality of different audio and/or
20 visual alarm signals corresponding to respective ones of
said plurality of classes of incoming call; and
means for activating the respective one of said plurality of
different audio and/or video alarm signals upon
identification of the extracted caller identification data
25 in one of said classes.

15. A telephone incorporating a device according to claim
14.

16. A telephone according to claim 15 wherein is provided
means for producing a plurality of different ringing sounds
30 corresponding to respective ones of said plurality of
classes of incoming call.

17. A system according to any of claims 1 to 7, 10 to 12,
in combination with a telephone device according to claim

14.

18. A method of displaying identification data
corresponding to a telephone caller on a television or on a
video display unit of a computer located at the site of the
5 call recipient but spaced apart from the telephone, the
method comprising the steps of:
detecting the presence of an incoming telephone call on a
bi-directional telephone line;
extracting caller identification data from a signal present
10 on the telephone line when an incoming call is detected;
generating a video signal containing the caller
identification data or identification data derived
therefrom, and
supplying the video signal to the television or the video
15 display unit for display thereon.



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Claims searched: 1-13, 17, 18

Examiner: Al Strayton
Date of search: 25 April 1996

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
UK CI (Ed.O): H4K: KFH
Int CI (Ed.6): H04M
Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 5 349 638 (PITRODA) Entire document, esp.: col.1, ll.55-62; col.2, ll.12-14, 23-30; col.7, ll.39-65	1,2,5-8,18
X	US 5 054 055 (HANLE) Entire document, esp. col.2, ll.10-50	1,2,5-7,10-13,18
X	US 4 776 005 (PETRICCIONE) Entire document, esp. col.9, ll.6-20	1,2,5-7,10-13,18

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